WEST VISAYAS STATE UNIVERSITY
COLLEGE OF EDUCATION
GRADUATE SCHOOL
Iloilo City

LEARNERS' CONCEPTUAL UNDERSTANDING OF BIOMOLECULES AND THEIR MINDSET LEANING: INPUTS FOR DEVELOPING AN INSTRUCTIONAL MATERIAL

A Dissertation Presented to the

Faculty of the Graduate School

College of Education

West Visayas State University

La Paz, Iloilo City

In Partial Fulfilment

of the Requirements for the Degree

Doctor of Philosophy in Science Education

(Biology)

by

Lally L. Sales

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APPROVAL SHEET

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Abstract

Previous research showed that students' mindsets could predict academic achievement, and developing a growth mindset has been shown to improve academic performance (Broghman & West, 2018). However, the absence of face-to-face instruction during the pandemic and the lack of instructional material in teaching and learning science topics created learning gaps for learners. To help solve this problem, this study aimed to develop an Instructional Material for Biomolecules that could develop learners' growth mindset using the Instructional Material Development research design. Analysis of the knowledge gaps using the researcher-made 80-item researcher-made Biomolecules Conceptual Understanding Assessment Tool (BMCUAT) revealed that the conceptual understanding of Grade 12- STEM learners was only FAIR. Likewise, analysis of their mindset leaning using the 16-item Contextualized Mindset Instrument adapted from Carol Dweck's Mindset Inventory revealed that most learners had No Clear Mindset about their intelligence and skills in the study of Biomolecules. These results and the outline of the instructional guide composed of learning objectives, exercises, content, assessment instruments, and selected media were used to design the instructional material. Development of a prototype instructional material composed of 15 modules patterned after the 7Es Instructional Model and centered on Most Essential Learning

Competencies in General Biology I followed. Virtual implementation of the developed instructional material - "BioMind: Understanding Biomolecules through the Mindset: A Guide for Teachers and Students," involved 20 Grade 12-STEM Learners, 8 Science Teachers, and 2 Registered Guidance Counselors. Evaluation of the modules using the Evaluation Form for Printed Instructional Material revealed a VERY ACCEPTABLE rating in terms of Content, Instructional Quality, Technical Quality, Presentation and Organization, Accuracy and Up datedness of Information, and Assessment. Thematic analysis of teachers' experiences after using the teaching and learning guide revealed great, awesome, enjoyable, positive, useful, educational, practical, vast, and indispensable experiences, in addition to learners' memorable and wonderful encounters with mindset, enjoyable, immensely educational, and freshly interesting experiences. Teachers' reflections showed that a high-quality growth mindset in developing instructional material improved teaching and learning because it effectively developed students' growth mindset. Likewise, students realized that the developed modules were necessary for learning. Using them evolved into positive emotions and beliefs, which made them resilient and persevere in their study. Therefore, the Teaching and Learning Guide is a high-quality instructional material that develops a growth mindset among its users.

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